Wet and Wild

For use with: Arizona Wildlife Views Television Show, 08-09 Season, Episode 4

Adaptations; Experimental Design; Outdoor Recreation **Time Frame:** 3-4 hours **Grade:** 4-8

Overview:

This video is primarily about water, especially some of the fun activities that can take place on or near water. First, we take a look at the annual Cardboard Boat Regatta that takes place at Tempe Town Lake. Then, we travel to Payson to learn about an event designed to get kids out to the lake to enjoy some fishing while at school. Although water can be fun, we have some concerns. The next segment focuses on the Gila River Watershed and some of the threatened and endangered species in that area. Finally, we visit the Clay Target Center at Ben Avery to see some improvements designed to make it more accessible to disabled people. Students will use their experience and knowledge to build boats out of aluminum foil.

Essential Questions

- Why is time spent in nature important?
- What is the value of wildlife?
- What place does creativity have in science?

Objectives

- List reasons why fish may go extinct.
- Explain how fish adaptations may help human health.
- Develop a boat, using aluminum foil, that can support weight for at least one minute.

Arizona Department of Education Standards

Science

4th grade	5th grade	6th grade	7th grade	8th grade
S2-C1-PO2	S5-C2-PO4	S2-C2-PO3	S2-C2-PO3	S2-C1-PO4
S2-C2-PO1		S3-C2-PO3	S3-C2-PO3	S2-C2-PO1
S3-C1-PO1		S4-C1-PO1	S4-C3-PO5	S3-C2-PO3
S3-C2-PO1				

Workplace Skills

4th – 8th grades
5WP-E3-PO1

Materials and Resources

- Copy of Arizona Wildlife Views episode
- Aluminum foil
- Pennies
- Water
- Tub, sink, or other container large enough to hold the water and test the boats

Teacher Preparation

- Acquire a copy of the television show. You can check local listings to determine when it will air and record it directly. You may also check the Department's web site to see if a copy can be downloaded or ordered.
- Write the vocabulary words and questions on the board.
- Cut aluminum foil into small squares of about 2" by 2".

Background Information:

This is not a lesson plan in the traditional sense. It does not provide step-by-step directions for completing an activity. Instead, it provides information to help you use an episode of the *Arizona Wildlife Views* television program in your classroom. It contains five suggested activities along with extensions and

modifications. The first activity focuses on vocabulary. We have provided and defined some of the words used in the video. You are encouraged to use any appropriate strategies to introduce these to your students. Then, there is a series of comprehension questions that students can answer while watching the video. Answers (directly from the video) are provided in italics. Next, the critical thinking questions build on the major concepts introduced in the video. Students need to put a little bit more thought into these questions. Some reasonable answers are provided in italics. However, teachers should be cautious and realize that students may provide additional answers that can be supported with evidence. Then, there is an in-depth activity. This activity allows students to evaluate and synthesize one or more of the concepts from the video, perhaps applying it to a new context or utilizing additional skills. The last activity allows students to explore wildlife-related careers in a little more detail.

This episode originally aired on PBS (KAET Channel 8) in Phoenix on February 8, 2009. It may also be shown on regional PBS stations or other channels. For additional viewing information or download options, please visit **http://www.azgfd.gov/focuswild**.

Additional information about the programs featured in this episode can be found at:

- ✓ Arizona Urban Fishing Program: http://www.azgfd.gov/h_f/urban_fishing.shtml
- ✓ Great Cardboard Boat Regatta: http://www.rotaryriverrally.com/info.html
- ✓ Fish Abstracts, Maps, and Pictures: http://www.azgfd.gov/w_c/edits/hdms_abstracts_fish.shtml
- ✓ Clay Target Center: http://www.azgfd.gov/ctc2/index.html

Relevant Vocabulary:

- o Cienega – a Spanish term representing a swampy wetland
- o Fauna – animal life
- o Hybridization – to mix or breed animals from different species
- o Indigenous – native to a particular region
- o Keel – a raised ridge or bump along the back of a fish
- o PFD – personal flotation device, often called a life jacket; used to keep a person afloat in water
- o Precocious – developing or maturing early
- o Regatta – a series of boat races
- o Steward – someone who manages or protects a property
- o Watershed – an area of land that drains to a particular body of water

Comprehension Questions:

1. When was the first-ever cardboard boat regatta held? When was it first held in Tempe? *Answer: It first occurred in 1974 but didn't start in Tempe until 2000.*
2. How much money has been raised for charity by the boat regatta? *Answer: Over $65,000.*
3. Which group sponsored the Billy Bass boat? *Answer: Arizona Game and Fish Department's Urban Fishing Program.*
4. What grade level of students got to participate in the Payson fishing event? *Answer: 5th grade.*
5. What type of fish were the students able to keep? *Answer: Trout.*
6. Name Arizona's two native trout species. *Answer: Apache and Gila trout.*
7. How long can the Colorado pike minnow get? *Answer: 6 feet.*
8. How many native fish species does Arizona have? How many are on the Federal endangered species list? *Answer: there are 35 native species and over half are federally listed.*

Critical Thinking Questions:

1. Why do you think so many of Arizona's native fish species are threatened, endangered, or extinct? *Answer: Water is a precious commodity in Arizona. As clean water becomes more rare, so do the species that live in it. Most water that remains is far from pristine, consisting of pollution or, maybe even worse, invasive species. Those species often outcompete the native fish, that have not yet adapted to the rapid changes to their habitats.*
2. Explain how the state's native fish are being used to help with research focused on human health and disease? *Answer: The animals and plants found in Arizona have many unique adaptations to survive in the variety of habitats. This includes the fish species. The Gila topminnow spends the majority of its life just below the surface of the water, completely exposed to the sun's harmful ultraviolet radiation. Yet, it suffers none of the ill effects of that exposure. So, researchers are studying the fish to learn more about skin cancer, and possible cures or treatments in humans. The desert pupfish is capable of surviving in extreme water temperatures while still maintaining healthy organ functions. As a result, biologists are using the fish as a model to examine kidney function and disease, and possible treatments in humans. Finally, the razorback sucker contains such a diverse genetic makeup that its DNA is being investigated in more general terms to see if we can learn anything about human genetic disorders.*

In-Depth Activity: Design a Boat

One segment in the video focused on a competition in which people had to develop a boat out of cardboard, a material not widely considered the best in water. We are going to recreate this contest on a smaller scale, using different materials.

The goal of this contest is to develop a boat that can hold the most pennies, using the least amount of material. The material of choice for this project: aluminum foil.

Using the small squares of aluminum foil, design a boat that you think will successfully float. Your boat must be capable of holding pennies for at least one minute.

After you have completed your boat, test it. Place it in some water and add some pennies. How long does it float? How many pennies can it hold? Based on this information, what changes can you make to improve it? Is it possible to use less aluminum foil and get the same, or better, results?

Once you have completed your changes, it is time for the competition to begin. Using your newly modified boat, place it in the water and begin placing a few pennies on it. If it is able to float for an extended time (about one minute), try even more pennies. Continue adding pennies, one at a time, until the boat no longer floats.

Compare the different boats in the class. Which boat design was able to hold the most pennies? Why do you think this design was so successful? Which design appears to be the most efficient (i.e., can hold the most pennies with the least amount of aluminum foil)? Why was this design so efficient?

If you were going to create a new boat, what changes would you now make?

Career Focus

This video provided a brief look at one or more careers related to wildlife management and conservation. These careers are listed below along with the segment of the video in which they appeared.

Watch the segments related to the specific career. Write down notes about how this career helps wildlife. Use the Internet to research additional information about this career, including specific job duties, education and training required, potential salaries, and future outlook.

Careers featured in this episode:

- Landscape Architect/Engineer (Segment 4)
- Medical Researcher (Segment 3)
- Wildlife Biologist (Segment 3)

Differentiated Instruction:

Extensions:

- **Language Arts:** Research one of Arizona's native fish. What was its historic range? Where is it found today? Is it endangered or threatened? What are its greatest threats? Write an essay on your fish.
- **Social Studies:** Use the Internet to research the history of fish in Arizona. Learn when the different sport fish were introduced as well as when various native fish were first placed on the endangered species list or went extinct. Try to find out about dates when reintroduction projects took place, as well. Create a timeline of these important events.

Modifications:

- Create a student handout with the vocabulary words and questions already provided.
- Provide students with the definitions and have them match them to the appropriate vocabulary words.
- Provide fill-in-the-blank responses for the Comprehension Questions, allowing students to listen for appropriate words to complete the sentences.
- Download the video transcripts (if available) and provide to students.

Reflection:

Use the space below to reflect on the success of the lesson. What worked? What didn't? These notes can be used to help the next time you teach the lesson. In addition, the Department would appreciate any feedback. Please visit **http://www.azgfd.gov/focuswild** and submit a lesson evaluation.